

*What is claimed is:*

1. In a gaming machine including a master gaming controller, a display  
5 device and a memory device, a method of generating a game of chance, the method  
comprising:  
receiving a wager for the game of chance controlled by the master gaming  
controller on the gaming machine wherein the gaming machine is capable of receiving  
indicia of credit for the wager from an input device coupled to the gaming machine  
10 and outputting indicia of credit from an output device coupled to the gaming machine;  
determining a game outcome for the game of chance by randomly selecting,  
one or more times, an index from a sequence of indices;  
for each index selected, drawing a portion of the indices from the sequence of  
indices on one or more three-dimensional (3-D) objects in a 3-D gaming environment  
15 wherein the portion of indices includes the selected index;  
rendering one or more two-dimensional (2-D) images derived from the one or  
more 3-D objects and the three-dimensional gaming environment as a game outcome  
presentation for the game of chance wherein information used to generate the one or  
more 3-D objects and the 3-D gaming environment is stored in the memory device on  
20 the gaming machine; and  
displaying the one or more rendered 2-D images to the display device on the  
gaming machine wherein the 2-D images display the portion of the indices.
2. The method of claim 1, wherein a combination of three indices is  
25 generated as the game outcome by randomly selecting i) a first index from a first  
sequence of indices, ii) a second index from a second sequence of indices and iii) a  
third index from a third sequence of indices.
3. The method of claim 2, wherein the first, second and third sequence of  
30 indices are the same sequence of indices.
4. The method of claim 1, wherein a combination of 5 indices is  
generated as the game outcome by randomly selecting i) a first index from a first

sequence of indices, ii) a second index from a second sequence of indices, iii) a third index from a third sequence of indices, iv) a fourth index from a fourth sequence of indices and v) a fifth index from a fifth sequence of indices.

5            5.        The method of claim 1, wherein the first, second, third, fourth and fifth sequence of indices are the same sequence of indices.

             6.        The method of claim 1, wherein the sequence of indices is a virtual reel strip.

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             7.        The method of claim 1, wherein the game of chance is a video slot game.

             8.        The method of claim 1, wherein the sequence of indices comprises two or more different types of indices.

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             9.        The method of claim 8, further comprising:  
                 mapping a set of symbols to each type of index and drawing the symbols on one or more the 3-D objects in the 3-D gaming environment.

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             10.       The method of claim 9, further comprising:  
                 for a first game of chance, mapping a first set of symbols to each type of index and drawing the symbols on the one or more 3-D objects in the 3-D gaming environment and for a second game of chance, mapping a second set of symbols to each type of index and drawing the symbols on the one or more 3-D objects in the 3-D gaming environment.

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             11.       The method of claim of 1, further comprising:  
                 determining a motion of the one or more 3-D objects in the gaming environment; and  
                 applying the determined motion to the one or more 3-D objects in the 3-D gaming environment.

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12. The method of claim 11, wherein the motion of a first 3-D object of the one or more 3-D objects is linear in the 3-D gaming environment.

13. The method of claim 11, wherein the motion of a first 3-D object of the one or more 3-D objects is non-linear in the 3-D gaming environment.

14. The method of claim 11, wherein the motion of a first 3-D object of the one or more 3-D objects is along a 3-D curve in the 3-D gaming environment.

15. The method of claim 1, further comprising:  
applying motions to a plurality of 3-D objects in the 3-D gaming environment wherein the motion for each object is linear and wherein the objects move in parallel paths and wherein indices are drawn on each of the plurality of 3-D objects.

16. The method of claim 1, wherein a first 3-D object of the one or more 3-D objects is at least one of a 2-D rectangle or a box in the 3-D gaming environment and the portion of the indices is drawn on at least one surface of the rectangle or the box.

17. The method of claim 1, wherein a first 3-D object of the one or more 3-D objects is at least one of a portion of a cylinder or a curved 2-D surface and the portion of the indices is drawn on at least one surface of the cylinder portion or the curved 2-D surface.

18. The method of claim 1, wherein each index in the portion of the indices is displayed sequentially over time in a plurality of rendered 2-D images that are displayed sequentially over time.

19. The method of claim 1, wherein each of the plurality of rendered 2-D images comprise a subset of a total number of indices in the portion of the indices.

20. The method of claim 1, wherein sequences of indices is displayed repetitively such that when an end of the sequence of indices is reached a next index that is displayed is a first index in the sequence of indices.

21. The method of claim 1, further comprising:  
generating the portion indices from the sequence of indices wherein the  
portion of indices comprises at least one of i) a number of indices in the sequence of  
5 indices prior to the randomly selected index, ii) a number of indices after the  
randomly selected index in the sequence of indices and iii) combinations thereof.
22. The method of claim 1, wherein a number of indices in the portion of  
indices are constant for each game of chance that is generated.
- 10 23. The method of claim 1, wherein a number of indices in the portion of  
indices varies for each game of chance that is generated.
24. The method of claim 1, wherein the portion of indices comprises:  
15 a first index from the sequence of indices; and  
the randomly selected index from the sequence of indices wherein the  
portion of indices that are drawn include all of the indices between the first  
index and the randomly selected index in the sequence of indices.
- 20 25. The method of claim 24, wherein the first index from the sequence of  
indices is determined from a previous game of chance generated on the game of  
chance.
26. The method of claim 1, wherein the portion of indices comprises:  
25 a first index from the sequence of indices; and  
the randomly selected index from the sequence of indices wherein the  
portion of indices that are drawn include a subset of the indices between the  
first index and the randomly selected index in the sequence of indices.
- 30 27. The method of claim 26, wherein the first index from the sequence of  
indices is determined from a previous game of chance generated on the game of  
chance.
28. The method of claim 1, further comprising:

receiving an input signal from a first input device on the gaming machine wherein the input signal provides information for altering the game outcome presentation for the game of chance.

5           29.     The method of claim 28, wherein the input signal is for one of stopping or starting the motion of the one or more 3-D objects.

          30.     The method of claim 28, wherein the input signal is for altering a motion of the one or more 3-D objects.

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          31.     The method of claim 1, further comprising:  
          applying motions to a plurality of 3-D objects in the 3-D gaming environment wherein the motion of each 3-D object begins at an object source.

15           32.     The method of claim 31, wherein a position of the object source in the 3-D gaming environment changes in time.

          33.     The method of claim 31, wherein a motion of first 3-D object originates at a first object source and a motion of a second 3-D object originates at a  
20     second object source at a different position from the first object source.

          34.     The method of claim 1, further comprising:  
          applying motions to a plurality of 3-D objects in the 3-D gaming environments wherein two or more objects are capable of colliding.

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          35.     The method of claim 1, further comprising:  
          detecting a collision between two or more 3-D objects in the 3-D gaming environment.

30           36.     The method of claim 1, further comprising:  
          determining the award of indicia of credit using the one or more randomly selected indices wherein the gaming machine is capable of the award of the indicia of credit via the output device.

37. The method of claim 1, further comprising:  
rendering a bonus game presentation in the 3-D gaming environment and  
capturing the bonus game presentation on the one or more two-dimensional images.

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38. The method of claim 1, further comprising:  
receiving an input signal to initiate one or more games of chance.

39. In a gaming machine including a master gaming controller, a display  
10 device and a memory device, a method of generating a game of chance, the method  
comprising:  
receiving a wager for the game of chance controlled by the master gaming  
controller on the gaming machine wherein the gaming machine is capable of receiving  
indicia of credit for the wager from an input device coupled to the gaming machine  
15 and outputting indicia of credit from an output device coupled to the gaming machine;  
determining randomly a final state on each of a plurality of virtual reel strips;  
for each virtual reel strip,  
a) determining a sequence of symbols to display from the virtual reel  
strip wherein each of the sequence of symbols comprises at least one of i) a  
20 number of symbols prior to the final state on the virtual reel strip; ii) a number  
of symbols after the final state on the virtual reel strip; or iii) combinations  
thereof;  
b) drawing the sequence of symbols over time on a surface defined in a  
3-D gaming environment;  
25 rendering a plurality of two-dimensional (2-D) images comprising the  
surfaces drawn with the symbols from the virtual reel strips as a game outcome  
presentation for the game of chance wherein information used to generate the surfaces  
and the 3-D gaming environment is stored in the memory device on the gaming  
machine; and  
30 displaying the one or more rendered 2-D images to the display device on the  
gaming machine wherein the 2-D images display the sequence of symbols from each  
of the virtual reel strips.

40. The method of claim 39, wherein the surface is one of a planar rectangular surface or a curved portion of an outside of a cylinder.

5 41. The method of claim 39, wherein 3 virtual reel strips are mapped to three different surfaces.

42. The method of claim 39, wherein 5 virtual reel strips are mapped to five different surfaces.

10 43. The method of claim 39, wherein a number of symbols displayed in each game outcome presentation is a constant.

44. The method of claim 39, further comprising:  
determining a motion for each of the surfaces in the 3-D gaming environment;  
15 and, while rendering the plurality of 2-D images, applying the determined motion for each of the surfaces in the 3-D gaming environment wherein the motion for each of the surfaces is captured in at least a portion of the plurality of the 2-D images.

20 45. The method of claim 44, wherein, when the 2-D images are viewed in a sequence, the rendered symbols appear to move along a linear path from a top of the display screen to the bottom of the display screen.

46. The method of claim 39, further comprising:  
generating at least one of a flat surface or a curved surface divided into a total  
25 number of segments of equal area at first position in the 3-D gaming environment;  
drawing in each of the number of segments of the flat surface or the curved surface a first subset of the sequence of symbols; and  
moving the flat surface or the curved surface from the first position by a  
distance equal to a height of one of the surface segments along surface while  
30 rendering the plurality of 2-D images.

47. The method of claim 44, further comprising:  
regenerating the flat surface or the curved surface at the first position in the 3-D gaming environment;

redrawing in each of the number of segments of the flat surface or the curved surface a second subset of the sequence of symbols;

moving the flat surface or the curved surface from the first position by the distance equal to the height of one of the surface segments while rendering the plurality of 2-D images; wherein the first subset and the second subset are defined so that when the plurality of 2-D images capturing the movement of the generated surfaces are viewed on the display screen, the symbols appear to enter and to leave the display screen in an order specified by the sequence of symbols for each virtual reel strip.

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48. The method of claim 47, wherein a sequence in the first subset and a sequence in the second subset overlap.

49. The method of claim 46, wherein the rate of movement of the surfaces varies over time.

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50. The method of claim 46, wherein the direction of movement varies over time.

51. The method of claim 46, wherein the movement of the flat surface or the curved surface is specified so that a rate of movement of the symbols appears to increase and then decrease during the game outcome presentation when the plurality of 2-D images capturing the movement of the generated surfaces are viewed on the display screen.

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52. The method of claim 46, wherein the movement of the flat surface or the curved surface is specified so that the symbols on the display screen appear to oscillate above and below their final positions prior to stopping when the plurality of 2-D images capturing the movement of the generated surfaces are viewed on the display screen.

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53. The method of claim 46, wherein the movement of the flat surface or the curved rectangular surface is specified so that the symbols on the display screen, prior to moving in a first direction appear to move slightly from their initial position



in a direction opposite of the first direction when the plurality of 2-D images capturing the movement of the generated surfaces are viewed on the display screen.

54. The method of claim 1, further comprising:  
5 dividing each surface into a number of segments and drawing at least one symbol from the sequence of symbols in each segment.

55. The method of claim 54, wherein a type of symbol drawn in each segment varies with time.  
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56. The method of claim 54, wherein a portion of the number is segments are viewable on the display screen at any one time when the one or more 2-D images are displayed to the display screen.

57. The method of claim 54, wherein positions of a portion of the number of segments are used to specify a payline when the one or more 2-D images are displayed to the display screen.  
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58. The method of claim 54, wherein, when the one or more 2-D images are displayed to the display screen, areas occupied by a portion of the number of segments on the display screen correspond to active areas of a touch screen sensor coupled to the display screen.  
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59. The method of claim 58, wherein the gaming machine is capable of altering a movement of a first surface in the 3-D gaming environment when an input signal is generated from an active area on the touch screen sensor above the first surface in one of the 2-D images.  
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60. The method of claim 39, further comprising:  
30 receiving an input signal from a first input device on the gaming machine indicating a stop command has been requested wherein the stop command is a request to stop a progression of symbols on one of the virtual reel strips viewed on the display screen;

determining a new sequence of symbols to display from the virtual reel strip wherein the new sequence of symbols allows the final state of the virtual reel strip to be displayed sooner than when the stop command is not received.

5           61.     The method of claim 39, further comprising:  
              determining the award of indicia of credit using the one or more randomly  
              selected indices wherein the gaming machine is capable of the award of the indicia of  
              credit via the output device.

10          62.     The method of claim 39, further comprising:  
              rendering a bonus game presentation in the 3-D gaming environment and  
              capturing the bonus game presentation on the one or more two-dimensional images.

              63.     The method of claim 39, further comprising:  
15          receiving an input signal from a first input device coupled to the gaming  
              machine to initiate one or more games of chance.

              64.     The method of claim 39, wherein the sequence of symbols to display  
              from the virtual reel strip is determined such that the sequence progresses through the  
20          virtual reel strip towards an end of the virtual reel strip.

              65.     The method of claim 39, wherein, when the end of the virtual reel strip  
              is reached in the sequence and more symbols are required for the sequence, a next  
              symbol in the sequence is selected from symbols near a beginning of the virtual reel  
25          strip and the sequence again progresses through the virtual reel strip towards the end  
              of the virtual reel strip.

              66.     The method of claim 39, further comprising:  
              displaying the final state for a plurality of virtual reel strips in a first  
30          game of chance;  
              storing the final state of each of the virtual reel strips;  
              for a second game of chance following the first game of chance,  
              determining the sequence of the symbols to display from the virtual  
              reels strips wherein the final states from the plurality of virtual reel strips from the

first game of chance are initial states of the sequence of symbols for the second game of chance.

5           67.     A virtual reel model for a 3-D gaming environment on a gaming machine wherein the gaming machine is capable of receiving indicia of credit for a wager for a game of chance from an input device coupled to the gaming machine and outputting indicia of credit from an output device coupled to the gaming machine, said virtual reel model comprising:  
                  a geometry definition of a reel model for the 3-D gaming environment;  
10               a first input parameter for specifying a total number of segments on the reel model wherein a symbol is drawn on each segment of the reel model in the 3-D gaming environment;  
                  a second input parameter for specifying an index of a home segment on the reel model wherein the index of the home segment is used to specify a starting  
15               location for a first payline that the gaming machine is capable of drawing in the 3-D gaming environment; and  
                  a third input parameter for specifying a number of visible segments wherein the visible segments are the number of segments above the home segment that are visible on a display screen on the gaming machine when 2-D images are  
20               rendered from the 3-D gaming environment comprising the reel model.

25           68.     The virtual reel model of claim 67, wherein the rendered 2-D images are used as part of a game outcome presentation for the game of chance viewed on the gaming machine.

              69.     The virtual reel model of claim 67, wherein the rendered 2-D images are used as part of a bonus game outcome presentation for the game of chance viewed on the gaming machine.

30           70.     The virtual reel model of claim 67, wherein the geometry definition of the reel model is for one of a flat strip or a curved rectangular strip.

              71.     The virtual reel model of claim 67, further comprising:

5 a fourth input parameter for specifying a number of touchable segments wherein the number of touchable segments specify active areas of a touch screen sensor coupled to the display screen that correspond to segment areas on 2-D images that are displayed to the display screen of the virtual reel model rendered from the virtual reel model generated in the 3-D gaming environment.

72. The virtual reel model of 67, further comprising:  
a fifth input parameter for specifying a number of different types of symbols that are drawn on each symbol.

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73. The virtual reel model of 67, further comprising:  
a plurality of motion parameters for specifying a movement of the reel model over time in the 3-D gaming environment.

15 74. The virtual reel model 67, wherein the plurality of motion parameters are used to define one or more of a) a cock-up movement of the reel model in the 3-D gaming environment, b) a cock-down movement of the reel model in the 3-D gaming environment, c) a bounce-up movement of the reel model in the 3-D gaming environment, d) a bounce-down movement of the reel model in the 3-D gaming  
20 environment, e) a stop position of the reel model in the 3-D gaming environment, and f) a velocity as a function of time of the reel model in the 3-D gaming environment and g) a path of the reel model in the 3-D gaming environment as a function of time.

25 75. A gaming machine comprising:  
a housing;  
a master gaming controller designed or configured to control a game of chance played on the gaming machine mounted within the housing and to execute game logic;  
an input device coupled to the housing capable of receiving indicia of  
30 credit for wagers on the game of chance;  
an output device coupled to the housing capable of outputting indicia of credit from the gaming machine;  
a memory device coupled to the housing for storing information used to generate a 3-D gaming environment comprising one or more virtual slot reels;

game logic executed on the gaming machine for rendering one or more two-dimensional images derived from the 3-D gaming environment; and

one or more display devices for displaying a game outcome presentation for the game of chance comprising said rendered one or more two-dimensional images.

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76. The gaming machine of claim 75, further comprising:

game logic for rendering one or more 2-D images derived from the 3-D gaming environment for a bonus game outcome presentation.

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77. The gaming machine of claim 75, wherein the game of chance is a video slot game.

78. The gaming machine of claim 75, further comprising:

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information for generating geometry of the one or more virtual slot reels in the 3-D gaming environment.

79. The gaming machine of claim 78, wherein the geometry is one of a flat strip or a curved strip.

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80. The gaming machine of claim 78, further comprising:

one or more virtual reel strips for mapping symbols to the one or more virtual slot reels.

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81. The gaming machine of claim 80, further comprising:

game logic for generating a sequence of symbols from the virtual reel strips as a function of time in the 3-D gaming environment and for rendering 2-D images from the 3-D gaming environment comprising the sequence of symbols.

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82. The gaming machine of claim 75, further comprising:

game logic for generating a motion of the one or more virtual slot reels in the 3-D gaming environment wherein, when a sequence of 2-D images capturing one or more the virtual slot reels at various positions in the 3-D gaming environment

is viewed on the display screen, the virtual slot reels appear to move on the display screen.

5           83.     The gaming machine of claim 82, wherein the symbols on each virtual slot reel appear to move along a straight line from the top of the display screen to the bottom of display screen.

          84.     The gaming machine of claim 75, further comprising:  
          an input mechanism designed or configured to receive an input signal used to  
10    change one of a position or a movement of the one or more virtual slot reels in the 3-D gaming environment.

          85.     The gaming machine of claim 84, wherein the input mechanism is selected from the group consisting of a key pad, a touch screen, a mouse, a joy stick, a  
15    microphone and a track ball.

          86.     The gaming machine of claim 75, wherein 3 virtual slot reels and their motions are modeled in the 3-D gaming environment.

20           87.     The gaming machine of claim 75, wherein 5 virtual slot reels and their motions are modeled in the 3-D gaming environment.

          88.     The gaming machine of claim 75, further comprising:  
          a graphical processing unit, separate from said master gaming controller,  
25    designed or configured to execute the graphical operations used to render one or more two-dimensional images derived from the 3-D gaming environment.

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